

## CLAIMS

What is claimed is:

1. In an arrangement of a plurality of electric machines, the electric machines are defined by axes in parallel relationship, wherein the electric machines include a common stator which incorporates a plurality of stator portions that cooperate with rotors insertable in the stator portions, wherein the number of rotors corresponds to the number of the axes of the electric machines.
2. The arrangement of claim 1, wherein the stator is made by at least one construction selected from the group consisting of laminated structure and composite material structure.
3. The arrangement of claim 1, and further comprising cooling means for cooling at least parts of the arrangement.
4. The arrangement of claim 3, wherein the cooling means includes a cooling channel disposed centrally in the stator.
5. The arrangement of claim 3, wherein the cooling means includes a cooling jacket at least partially circumscribing the stator.

6. The arrangement of claim 1, and further comprising optimizing means for optimization of a magnetic field at overlap zones of magnetic fields of the arrangement.
7. The arrangement of claim 6, wherein the optimizing means optimize magnetic fields between neighboring electric machines.
8. The arrangement of claim 6, wherein each stator portion of the stator has a circumference and includes slots which are spaced about the circumference and define first slots in the area of the overlap zones and remaining second slots, wherein the first slots have a geometry which differs from a geometry of the second slots.
9. The arrangement of claim 8, wherein the first and second slots have a depth and a width, wherein the depth and the width of the first slots is smaller than the depth and the width of the second slots.
10. The arrangement of claim 6, wherein the optimizing means includes flux barriers.
11. The arrangement of claim 10, wherein the flux barriers are realized by slits.

12. The arrangement of claim 10, wherein the flux barriers are realized by non-magnetic material.
13. The arrangement of claim 1 for use in machine tools.
14. The arrangement of claim 13, wherein the machine tools are multi-spindle machines.
15. A multiple electric machine system, comprising:
  - a single stator having a plurality of cutouts;
  - a plurality of rotors, each of the rotors being disposed in a corresponding one of the cutouts, whereby the rotors and the cutouts are placed into one-to-one correspondence, to thereby realize a plurality of electric machines in side-by-side disposition with axes in parallel relationship.
16. The system of claim 15, wherein the cutouts are evenly spaced about a circumference of the stator so that the electric machines are disposed in a circular configuration.
17. The system of claim 15, wherein the cutouts are arranged next to one another in a linear alignment so as to realize a linear disposition of the electric machines.

18. The system of claim 15, wherein each of the cutouts of the stator is so configured as to be bounded about its circumference by spaced-apart slots for placement of windings.
19. The system of claim 15, wherein the stator is composed of a stack of laminations.
20. The system of claim 15, and further comprising cooling means formed in the stator.
21. The system of claim 20, wherein the cooling means includes at least one of a cooling arrangement selected from the group consisting of a first cooling channel disposed centrally in the stator for circulation of a coolant, second cooling channels formed about a periphery of the stator for circulation of a coolant, and a cooling jacket at least partially circumscribing the stator.
22. The system of claim 18, wherein the circumferential slots define first slots in an area between neighboring electric machines and remaining second slots, wherein the first slots have a geometry which differs from a geometry of the second slots, to thereby optimize a magnetic field in the area between neighboring electric machines.

23. The system of claim 22, wherein the first and second slots have a depth and a width, wherein the depth and the width of the first slots is smaller than the depth and the width of the second slots.
24. The system of claim 15, and further comprising flux barriers realized by slits in the stator for routing the magnetic flux in an area between neighboring electric machines.